भारतीय मानक

Indian Standard

IS 4079 : 2023

पैक किये हुए रसगुल्ले — विशिष्टि

(पहला पुनरीक्षण)

Packed *Rasogolla* — Specification

(First Revision)

ICS 67.100.99

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Dairy Products and Equipment Sectional Committee, FAD 19

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Dairy Products and Equipment Sectional Committee had been approved by the Food and Agriculture Division Council.

Rasogolla is a popular *Chhana* based sweet. Milk is first boiled and curdled, usually by adding an adequate quantity of whey or permitted coagulants. The curd is then transferred over a piece of clean and wet muslin cloth and the four ends of the cloth are tied with a knot and hanged onto a hook/stand and drained for 30 min. The drained curd is then cooled by immersing the cloth in cold water. When sufficiently cooled, the bag if taken out and the excess fluid gently squeezed. The sweet curd called '*Chhana'* is then kneaded to a creamy consistency and made into small balls which are immediately boiled in clarified sugar syrup for about 20 min to 25 min. *Rasogolla*, along with hot syrup, are filled in sterilized containers. The filled containers are immediately sealed and cooled. Packed *Rasogolla* is a commonly available product owing to its convenience and longer shelf life.

Keeping in view the considerable amount of interstate trade and export market of *Rasogolla*, this standard was originally laid down in 1967 with the title 'Specification for canned *Rasogolla*'.

This first revision has been brought to incorporate the following major changes:

a) Title has been modified as 'Packed *Rasogolla*';
b) Concentration of syrup has been updated;
c) Microbiological requirements have been updated; and
d) Test methods have been updated.

In the formulation of this standard, due consideration has been given to the provisions of the *Food Safety and Standards Act*, 2006 and the Rules and Regulations framed thereunder and the *Legal Metrology (Packaged Commodities) Rules*, 2011. However, this standard is subject to the restrictions imposed under these, wherever applicable.

The composition of the committee responsible for formulation of the standard is listed in Annex H.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

PACKED *RASOGOLLA* — SPECIFICATION

(First Revision)

1 SCOPE

This standard prescribes the requirements and methods of test for packed *Rasogolla* prepared from milk or *Chhana*.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards.

3 REQUIREMENTS

3.1 Packed *Rasogolla* shall be prepared from *Chhana* obtained from clean, fresh and sweet milk. It shall be white or light creamy in colour; and free from dirt and other foreign matter as well as insect and mould growth.

3.2 *Rasogolla* shall also comply with the requirements given under Table 1 and Table 2.

Table 1 Requirements for *Rasogolla*
(*Clause* 3.2)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Moisture, percent by mass, *Max*	55.0	Annex A of IS 10484
ii)	Fat, percent by mass, *Min*	5.0	IS 12758
iii)	Sucrose, percent by mass, *Max*	45.0	Annex B
iv)	Proteins, percent by mass, *Min*	5.0	IS 11917

Table 2 Microbiological Requirements for *Rasogolla* Balls
(*Clause* 3.2)

Sl No.	Characteristic	Requirement				Method of Test, Ref to[2)]
		Sampling Plan[1)]		Limit (cfu)		
		n	c	m	M	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Aerobic plate count	5	3	5/g	15/g	IS 5402 (Part 1)
ii)	*Staphylococcus aureus* (Coagulase positive)	5	0	Absent/25 g	–	IS 5887 (Part 8/Sec 1* or Sec 2)
iii)	*Escherichia coli*	5	0	Absent/25 g	–	IS 5887 (Part 1)

Table 2 (*Concluded*)

Sl No.	Characteristic	Requirement				Method of Test, Ref to[2)]
		Sampling Plan[1)]		Limit (cfu)		
		n	c	m	M	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
iv)	*Salmonella sp*.	5	0	Absent/25 g	–	IS 5887 (Part 3/Sec 1)
v)	*Shigella sp.*	5	0	Absent/25 g	–	IS 16429
vi)	*Clostridium spp.*	5	0	Absent/25 g	–	IS 5887 (Part 4)
vii)	*Listeria monocytogenes*	5	0	Absent/g	—	IS 14988 (Part 1)
viii)	Yeast and mold count	5	0	< 5/ml	—	IS 16069 (Part 1)

NOTES
1 For sampling plan, *see* Annex C.
2 In case of dispute, the method indicated by '*' shall be the referee method.
3 The requirement for *Salmonella* and *Shigella* shall be tested in a laboratory situated away from the production area.

3.3 The sugar syrup shall be clear and shall conform to the requirements given in Table 3 and Table 4. As determined by the method given in **F-3.3**, the proportion of free syrup in a *Rasogolla* pack shall not exceed sixty percent of the declared net mass.

Table 3 Requirements for Syrup
(*Clause* 3.3)

Sl No.	Characteristic	Requirement	Method of Test, Ref to
(1)	(2)	(3)	(4)
i)	Acidity of syrup, ml of N/10 NaOH required to neutralized 100 ml of the syrup, *Max*	6.0	Annex D
ii)	Concentration of syrup, *Min*	50° Brix	Annex E

Table 4 Microbiological Requirements for Sugar Syrup
(*Clause* 3.3)

Sl No.	Characteristic	Requirement				Method of Test, Ref to
		Sampling Plan		Limit (cfu)		
		n	c	m	M	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Aerobic plate count	5	3	5/ml	15/ml	IS 5402(Part 1)
ii)	Yeast and mold count	5	0	< 5/ml	—	IS 16069 (Part 1)
iii)	*Clostridium spp.*	5	0	Absent/25 g	—	IS 5887 (Part 4)

NOTE — For sampling plan, *see* Annex C.

3.4 The heavy metals, pesticide residues, antibiotic and veterinary drug residues, toxic substances (melamine) and other contaminants, if any, in the raw materials used in the manufacture of the product

shall not exceed the limits as prescribed in the *Food Safety and Standards (Contaminants, Toxins and Residues) Regulations,* 2011.

3.5 The product shall be manufactured and packed under hygienic conditions as prescribed in IS 2491.

4 PACKING, MARKING AND STORAGE

4.1 Packing

The material shall be filled in sterilized sanitary, cans or any other suitable containers with as little air as possible. The container should preclude contamination with metals or other impurities.

4.2 Marking

The following information shall be marked legibly and indelibly on each container:

a) Name of the product;
b) List of the ingredients in the descending order;
c) Name and address of the manufacturer;
d) Batch or code number;
e) Month and year of manufacturing or packing;
f) Net mass of the contents;
g) Drained mass (optional);
h) Number of *Rasogolla* in the container (optional);
j) Direction for storage;
k) Expiry/use by (date, month and year); and
m) Any other requirements under the *Food Safety and Standards (Labelling and Display) Regulations*, 2020 and the *Legal Metrology Act*, 2009 and rules framed thereunder.

4.2.1 *BIS Certification Marking*

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

4.3 Storage

The containers shall be stored in a cool place.

5 SAMPLING

Representative samples of the product shall be drawn as prescribed in Annex F.

6 QUALITY OF REAGENTS

Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (*see* IS 1070) shall be used where the use of water as a reagent is intended.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

ANNEX A
(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No.	*Title*
IS 1070 : 1992	Reagent grade water — Specification (*third revision*)
IS 2491 : 2013	Food hygiene — General principles — Code of practice (*third revision*)
IS 5402 (Part 1) : 2021/ISO 4833-1: 2013	Microbiology of the food chain — Horizontal method for the enumeration of microorganisms: Part 1 Colony count at 30 °C by the pour plate technique (*third revision*)
IS 5887	Methods for detection of bacteria responsible for food poisoning:
(Part 1) : 1976	Isolation, identification and enumeration of *Escherichia coli* (*first revision*);
(Part 3/Sec 1) : 2020/ISO 6579-1 : 2017	Horizontal method for the detection, enumeration and serotyping of *Salmonella*, Section 1 Detection of *Salmonella* spp. (*third revision*);
(Part 4) : 1999	Isolation and identification of *Clostridium perfringens* (*Clostridium welchii*) and *Clostridium botulinum* and enumeration of *Clostridium perfringens* (*second revision*);
(Part 8/Sec 1) : 2002/ISO 6888-1: 1999	Horizontal method for enumeration of coagulase-positive Staphylococci (*Staphylococcus aureus* and Other Species), Section 1 Technique using Baird-Parker agar medium;
(Part 8/Sec 2) : 2002/ISO 6888-2 : 1999	Horizontal method for enumeration of coagulase — Positive (*Staphylococcus aureus* and other species), Section 2 Technique using rabbit plasma fibrinogen agar medium
IS 10484 : 2021	Paneer — Specification (*first revision*)
IS 11917 : 2018/ISO 8968-1 : 2014	Milk and milk products — Determination of nitrogen content — Kjeldahl principle and crude protein calculation (*first revision*)
IS 12758 : 2005/ISO 1735 : 2004	Cheese and processed cheese products — Determination of fat content — Gravimetric method (Reference method) (*first revision*)
IS 16069 (Part 1) : 2013/ISO 21527-1 : 2008	Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds: Part 1 Colony count technique in products with water activity greater than 0.95
IS 16429 : 2018/ISO 21567 : 2004	Microbiology of food and animal feeding stuffs — Horizontal method for the detection of *Shigella* spp.

ANNEX B

[*Table* 1, *Item* (iii)]

DETERMINATION OF SUCROSE

B-0 GENERAL

B-0.1 Two methods, one polarmetric (*see* **B-1**) and the other volumetric (*see* **B-2**), are described for the determination of sucrose. Volumetric (Lane-Eynon) method shall be used for referee purposes and Polarimetric method may be used for routine analysis.

B-1 POLARIMETRIC METHOD

B-1.1 Apparatus

B-1.1.1 *Polarimeter* — of Suitable Type.

B-1.2 Reagents

B-1.2.1 *Mercuric Nitrate Solution*

To 220 g of yellow oxide or mercury, add 300 ml to 400 ml of water and sufficient nitric acid (sp gr 1.42) to form clear solution, care being taken to use the least possible excess of acid (approximately 140 ml will be required). Dilute to 800 ml to 900 ml and add 10 percent (*w/v*) sodium hydroxide slowly with constant shaking until a light permanent precipitate is obtained. Dilute to one litre and filter.

B-1.2.2 *Standard Sodium hydroxide Solution* — approximately 0.5 N.

B-1.2.3 *Hydrochloric Acid* — sp gr 1.102 9 at 20 °C/4 °C.

B-1.3 Procedure

B-1.3.1 Weigh 20 g of the material into a 100 ml volumetric flask, dilute to mark with water, mix thoroughly and filter through a dry filter paper, discarding the first 5 ml of the filtrate. Pipette 50 ml of the solution into a 100 ml flask, add 25 ml of water and mix. Add 5 ml of the mercuric nitrate solution and shake thoroughly without delay. Neutralize to litmus paper while shaking, constantly with the standard sodium hydroxide solution, but take care to avoid alkaline reaction (about 12 ml to 13 ml will be required). Dilute to 100 ml mark with water, mix thoroughly and filter through a dry filter paper.

B-1.3.1.1 Pipette out 25 ml of the filtrate into a 50 ml volumetric flask, dilute to mark with water and polarize into 200 mm tube.

B-1.3.1.2 Pipette 50 ml or the filtrate into a l00 ml volumetric flask, add 10 ml of hydrochloric acid and set aside for 24 hours at a temperature not below 20 °C. Make up to 100 ml at 20 °C and polarize.

B-1.3.2 Correct both the readings taken before and after inversion for the volume occupied by protein and fat assuming that one gram or protein occupies 0.8 ml and one gram of fat occupies 1.075 ml of space. The method given in IS 11917 shall be followed for the determination of protein in the sample.

B-1.4 Calculation

$$\text{Surcose, percent by mass} = \frac{2600\,(a-b)}{M\,(142.35-\frac{1}{2})}$$

where

a = corrected direct polarization;
b = corrected invert polarization;
M = mass of the material taken for the test; and
t = temperature in degree celsius of the solution polarized.

B-2 VOLUMETRIC (LANE-EYNON) METHOD

B-2.1 Reagents

B-2.1.1 *Sodium Hydroxide Solution*

Use approximately 4 N sodium hydroxide, analytical reagent grade, at the beginning of titration and use approximately 0.1 N sodium hydroxide, analytical reagent grade, near the end point.

B-2.1.2 *Stock Solution of Invert Sugar*

Weigh accurately 9.5 g of pure sucrose on a watch glass and transfer it' to one-litre volumetric flask with 100 ml of water. Add 5 ml of concentrated hydrochloric acid. Allow this to stand for 3 days at 20 °C to 25 °C and then make up to volume with water (this is stable for several months).

B-2.1.3 *Standard Solution of Invert Sugar*

Neutralize a known aliquot of stock sugar of invert sugar (**B-2.1.2**) with dilute hydroxide litmus paper and dilute with water to a known volume so that more than 15 ml but less than 50 ml of it shall be required to reduce all the copper in Fehling's solution taken for titration. Note the concentration of invert sugar in this solution as mg per 100 ml

(*see* also Note). Prepare this solution fresh every day.

NOTE 1 — When 10 ml of Fehling's solution is taken for titration, a standard invert sugar solution containing 0.12 percent to 0.30 percent (*w/v*) of invert sugar is used.

B-2.1.4 *Methylene Blue Indicator Solution*

Dissolve 0.2 g of methylene blue in water and dilute to 100 ml.

B-2.1.5 *Fehling's Solution (Soxhlet Modification)*

Prepare by mixing, immediately before use, equal volumes of Solution A and Solution B prepared as given below.

B-2.1.5.1 *Solution A*

Dissolve 34.639 g or copper sulphate ($CuSO_45H_2O$) in water, add 0.5 ml of concentrated sulphuric acid of sp gr 1.84 and dilute to 500 ml in a volumetric flask. Filter the solution through prepared asbestos.

B-2.1.5.2 *Solution B*

Dissolve 173 g of Rochelle salt (potassium sodium tartarate-$KNaC_4H_4O_4$,4 H_2O) and 50 g of sodium hydroxide, analytical reagent grade, in water, dilute to 500 ml in a volumetric flask and allow the solution to stand for two days. Filter this solution through prepared asbestos.

B-2.1.5.3 *Standardization of Fehling's solution*

Pour standard invert sugar solution (*see* **B-2.1.3**) into a 50 ml burette (*see* Note 6). Pipette 10 ml (*see* Note 1) of Fehling's solution into a 300 ml flask and run in from the burette almost the whole of the standard invert sugar solution required to effect reduction of all the copper, so that not more than one millilitre will be required later to complete the titration. Heat the flask containing the mixture over a wire gauze. Gently boil the contents of the flask for 2 minutes. At the end of this period, add, without interrupting the boiling, one milliliter of methylene blue indicator solution. While the contents of the flask continue to boil, begin to add standard invert sugar solutions (one or two drops at a time) from the burette till blue colour of the indicator just disappears. Titration should be completed within one minute so that contents of the flask boil altogether for 3 minutes without interruption (*see* Note 5). Note the titre (that is, the total volume in millilitres of standard invert sugar solution used for the reduction of all the copper in 10 ml of Fehling's solution).

B-2.1.6 *Zinc Acetate Solution*

Dissolve 21.9 g of crystallized zinc acetate [$Zn(C_2H_2O_2)_22H_2O$] in water and add 3 ml of glacial acetate acid. Make up to 100 ml.

B-2.1.7 *Potassium Ferrocyanide Solution*

Dissolve 10.6 g of crystalline potassium ferrocyanide in water and make up to 100 ml.

B-2.1.8 *Concentrated Hydrochloric Acid Solution* — sp gr 1.16.

B-2.1.9 *Concentrated Ammonia Solution* — sp gr 0·88.

B-2.1.10 *Dilute Ammonia Solution* — 10 ml concentrated ammonia solution diluted to 100 ml with water.

B-2.1.11 *Dilute Acetic Acid Solution* — approximately equivalent to the dilute ammonia solution in strength.

B-2.2 Procedure

B-2.2.1 *Preparation of the Solution*

Weigh accurately about 40 g of the well-mixed sample and transfer to a 100 ml beaker. Add 50 ml hot water at 80 °C to 90 °C. Mix and transfer to a 250 ml measuring flask, washing it with successive quantities of distilled water at 60 °C until the volume is 120 ml to 150 ml. Mix, cool to room temperature and add 5 ml of dilute ammonia solution. Mix and allow to stand for 15 minutes. Add the exact equivalent of dilute acetic acid to neutralize the ammonia added. Mix and add 12.5 ml of zinc acetate solution followed by 12.5 ml of potassium ferrocyanide solution. Mix again, make up to 250 ml mark. Allow to settle and filter. Mark this solution as B_1.

B-2.2.1.1 Pipette 50 ml of solution B_1 (*see* **B-2.2.1**) into a 100 ml volumetric flask, add 5 ml of concentrated hydrochloric acid and heat at 68 °C for 5 minutes. Cool the solution and neutralize with sodium hydroxide solution. Mark this solution as A_1. Make up to 100 ml. Dilute the solutions B_1 and A_1 so that the volume of solution required for 10 ml Fehling's solution (*see* **B-2.2.2**) is between 15 ml and 50 ml, mark them B_2 and A_2, respectively.

B-2.2.2 *Incremental Method of Titration*

Pour the prepared solution (*see* **B-2.2.1.1**) into a

50 ml burette (*see* Note 6). Pipette 10 ml of Fehling's solution into a 300 ml conical flask and run in from the burette 15 ml of the solution. Without further dilution heat the contents of the flask over a wire gauze and boil. (After the liquid has been boiling for about 15 seconds, it will be possible to judge if the copper is almost all reduced by the bright red colour imparted to the, boiling liquid by the suspended cuprous oxide). When it is judged that nearly all the copper is reduced, add one millilitre of methylene blue indicator solution (*see* Note 2). Continue boiling the contents of the flask for one to two minutes from the commencement of ebullition and then add the prepared solution in small quantities (one millilitre or less at a time), allowing the liquid to boil for about 10 seconds between successive additions, till blue colour of the indicator just disappears (*see* Note 5). In case there appears to be still much unreduced copper, after the mixture of Fehling's solution with 15 ml of the prepared solution has been boiling for a quarter of a minute, add the prepared solution from the burette in larger Increments (more than one millilitre at a time, according to judgment) and allow the mixture to boil for a quarter of minute after each addition. Repeat the addition of the prepared solution at intervals of 15 seconds until it is considered unsafe to add a large increment of the prepared solution. At this stage, continue boiling for an additional one to two minutes, add one millilitre of methylene blue indicator solution and complete the titration by adding the prepared solution in small quantities (less than one millilitre at a time) (*see* also Note 3).

NOTE 2 — It is advisable not to add the indicator until the neighborhood of the end point has been reached because the indicator retains its full colour until the end point is almost reached and thus gives warning to the operator to go slowly.

NOTE 3 — When the operator has had a fair amount of experience with the method, a sufficiently accurate result may then be obtained by a single estimation by the incremental method of titration, but for the utmost degree of accuracy for which the method is capable a second titration should be carried out by the standard method titration (*see* **B-2.2.3**).

B-2.2.3 *Standard Method of Titration*

Pipette 10 ml of Fehling's solution into a 300 ml conical flask and run in from the burette almost the whole of the prepared solution B_2 required to effect reduction of all the copper (determined under **B-2.2.2**), so that, if possible, not more than one milliliter shall be required later to complete the titration. Gently boil the contents of the flask for 2 minutes. At the end of this period, add, without interrupting boiling, one millilitre of methylene blue indicator solution. While the contents of the flask continue to boil, begin to add the prepared solution (one or two drop at a time) from the burette till blue color of the indicator just disappears (*see* Note 4). Titration should be completed within one minute, so that the contents of the flask boil altogether for 3 minutes without interruption.

NOTE 4 — The indicator is so sensitive that it is possible to determine the end point within one drop of the prepared solution in many cases. Complete decolorization of methylene blue is usually indicated by the whole reaction liquid in which cuprous oxide is continuously churned up becoming bright red or orange in colour. In case of doubt, the flame may be removed from the wire gauze for one or two seconds and the flask held against a sheet of white paper. (A holder of paper, suitably fixed round the neck of the flask, is very convenient for this purpose as it may be left round the neck of the flask without the risk of over-balancing it.) The tope edge of the liquid would appear bluish if the indicator is not completely decolorized. It is advisable to interrupt the boiling as the indicator undergoes back oxidation rather rapidly when air is allowed free access into the flask, but there is no danger of this as long as a continuous stream of steam is issuing from the mouth of the flask.

NOTE 5 — It should be observed that both the incremental and the standard methods of titration, the flask containing the reaction mixture is left on the wire gauze over the flame throughout titration.

NOTE 6 — In adding sugar solution to the reaction mixture, the burette may be held in hand over the flask. The burette may be fitted with a small outlet tube bent twice at right angles, so that the body of the burette can be kept out of steam while adding sugar solution. Burette with glass taps are unsuitable for this work as taps become heated by steam and are able liable to jam.

B-2.2.4 Repeat the titration as given in **B-2.2.2** and **B-2.2.3** using solution A_2 (*see* **B-2.2.1.1**).

B-2.3 Calculation

Sucrose, percent by mass = $\frac{25\,M_1}{M_2}\left[\frac{2f_2}{V_2} - \frac{f_1}{V_1}\right]$

where

M_1 = mass in mg, of sucrose corresponding to 10 ml of Fehling's solution (*see* **B-2.1.5.3**);

M_2 = mass in g, of the material taken for the determination (*see* **B-2.2.1**);

f_2 = dilution factor, for solution A_2 from A_1 (*see* **B-2.2.1.1**);

V_2 = volume in ml, of solution A_2 corresponding to 10 ml of Fehling's solution (*see* **B-2.2.4**);

f_1 = dilution factor for solution B_2 from B_1 (*see* **B-2.2.1.1**); and

V_1 = volume in ml, of solution B_2 corresponding to 10 ml of Fehling's solution (*see* **B-2.2.3**).

ANNEX C
(*Table* 2 *and* 4)

SAMPLING PLAN FOR MICROBIOLOGICAL REQUIREMENTS

C–1 SAMPLING PLAN FOR MICROBIOLOGICAL REQUIREMENTS

The terms *n*, *c*, *m* and *M* used in this standard have the following meaning:

n = Number of units comprising a sample;

c = Maximum allowable number of units having microbiological counts above *m* for 2-class sampling plan and between *m* and *M* for 3-class sampling plan;

m = Microbiological limit that separates unsatisfactory from satisfactory in a 2-class sampling plan or acceptable from satisfactory in a 3-class sampling plan; and

M = Microbiological limit that separates unsatisfactory from satisfactory in a 3-class sampling plan.

C-2 INTERPRETATION OF RESULTS

2-Class Sampling Plan (*where n, c and m are specified*)	*3-Class Sampling Plan* (*where n, c, m and M are specified*)
1. Satisfactory, if all the values observed are $\leq m$	1. Satisfactory, if all the values observed are $\leq m$
2. Unsatisfactory, if one or more of the values observed are $> m$ or more than *c* values are $> m$	2. Acceptable, if a maximum of *c* values are between *m* and *M* and the rest of the values are observed as $\leq m$
	3. Unsatisfactory, if one or more of the values observed are $> M$ or more than c values are $> m$

ANNEX D
[*Table* 2, *Item* (i)]

DETERMINATION OF ACIDITY OF SYRUP

D-1 REAGENTS

D-1.1 Standard Sodium Hydroxide Solution — 0.1 N.

D-1.2 Phenolphthalein Indicator Solution

Dissolve 0.5 g of phenolphthalein in 100 ml of 50 percent ethyl alcohol (*v*/*v*).

D-2 PROCEDURE

Measure 100 ml of syrup in a suitable titration flask.

Add one millilitre of phenolphthalein indicator solution. Shake well and titrate against standard sodium hydroxide solution. The persistence of slight pinkish tinge for 30 seconds indicates the end point. Report acidity as the number of ml of 0.1 N sodium hydroxide solution used to neutralize 100 ml of syrup.

ANNEX E

[*Table* 2, *Item* (ii)]

DETERMINATION OF CONCENTRATION OF SYRUP

E-1 APPARATUS

E-1.1 Specific Gravity Bottle

E-2 PROCEDURE

Clean and thoroughly dry the specific gravity bottle and weigh it. Fill it up to the mark with freshly boiled and cooled water maintained at a temperature of 20 °C ± 1 °C and weigh. Remove the water, dry the bottle again and fill it with the syrup maintained at the same temperature. Weight the bottle again.

E-3 CALCULATION

E-3.1 Specify the temperature of testing.

E-3.1.1 Calculate as follows:

Specific gravity at 20 °C/20 °C = $\frac{C-A}{B-A}$

where

C = mass in g, of the specific gravity bottle with the material;

A = mass in g, of the empty specific gravity bottle; and

B = mass in g, of the specific gravity bottle with water.

E-3.1.1.1 Calculate the degrees Brix with the help of the table given in Annex G.

ANNEX F

(*Clause* 5)

SAMPLING OF *RASOGOLLA*

F-1 GENERAL REQUIREMENTS

F-1.0 In drawing, preparing, storing and handling the samples, the following precautions and directions shall be observed.

F-1.1 The sampling instrument shall be clean and dry when used.

F-1.2 Precautions shall be taken to, protect the samples, the materials being sampled, the sampling instrument and the containers from adventitious contamination.

F-1.3 Sampling shall be done by a person agreed to between the purchaser and the vendor and, if desired by either of them, in the presence of the purchaser (or his representative) and the vendor (or his representative).

F-2 SCALE OF SAMPLING

F-2.1 Lot

All the containers in a single consignment of the material drawn from a single batch of manufacture shall constitute a lot. If a consignment is declared or known to consist of different batches of manufacture, the containers belonging to the same batch shall be grouped together and each group shall constitute a separate lot.

F-2.1.1 Samples shall be tested for each lot ascertaining the conformity of the material to the requirements of this standard.

F-2.2 The number n of containers to be selected from the lot shall depend on the size *N* of the lot and shall be as given in Table F-1.

Table F-1 Number of Containers to be Selected for Sampling

Lot Size	No. of Container To be Selected
N	*N*
(1)	(2)
101 to 300	9
301 to 500	12
501 to 1 000	15
1 001 to 3 000	21
3 001 and above	27

F-2.3 These containers shall be selected at random from the lot and, to ensure the randomness of selection, a random number table as agreed to between the purchaser and the vendor shall be used. In case such a table is not available, the following procedure shall be adopted.

F-2.3.1 Starting from any container, count them as 1, 2, 3,….,etc up to r in a systematic manner. Every r^{th} container thus counted shall be withdrawn from the lot to give a sample for test where $r = N/n$, N being the size of the lot and n the number of containers to be selected (*see* Table F-1). In case r comes to be a fractional number, its value shall be taken as equal to the integral part of it.

F-3 TEST SAMPLES AND REFEREE SAMPLE

F-3.1 The containers selected as in **F-2.2** shall be divided at random into three equal sets and labelled with all the particulars of sampling. One of these sets of sample containers shall be for the purchaser, another for the vendor and the third for the referee.

F-3.2 Referee Sample

The referee sample shall consist of a set of sample containers and shall bear the seals of the purchaser and the vendor (or their representatives) and shall be kept at a place agreed to between the two.

F-3.3 Preparation or Sample for Analysis

Keep the containers in the sample at 40 °C for 20 minutes. Empty the containers individually on a sieve of about one square centimetre mesh and of such size that all the *Rasogollas* are in one layer. Allow the syrup to drain for 10 minutes in a tared container. The mass of the *Rasogolla* and the syrup are recorded to determine the ratio of *Rasogolla* to syrup separately for each container in the sample (*see* **3.3**).

F-3.3.1 Cut the *Rasogolla* into small pieces and mix thoroughly in a suitable mixer separately for each container. Thus there will be as many mixed samples as the number of containers in the sample. Each of the mixed samples shall be tested separately for requirements given in Table 1 and Table 2.

F-3.3.2 The syrup collected from individual containers shall be mixed to form a composite sample. This composite sample shall be tested for requirements given In Table 3 and Table 4.

F-4 CRITERION FOR CONFORMITY

F-4.1 The lot shall he declared as conforming to this specification if the requirements specified in **F-4.1.1** to **F-4.1.3** are satisfied.

F-4.1.1 On each of the selected containers, the proportion of free syrup in a *Rasogolla* pack shall not exceed sixty percent of the declared net mass (*see* **3.3**).

F-4.1.2 The test results on the composite sample prepared in accordance with **F-3.3.2** shall satisfy the requirements for the characteristics as given in Table 3 and Table 4.

F-4.1.3 The test results for moisture, fat, sucrose and proteins on *Rasogolla* shall be recorded as shown in Table F-2. The mean and range for the test results of the containers shall be calculated as follows:

$$\text{Mean (X)} = \frac{Sum\ of\ test\ results}{Number\ of\ test\ results}$$

Range (R) = The difference between the maximum and the minimum values of test results.

The mean and range shall be recorded as shown in col 4 and 5 of Table F-2, respectively. The corrected mean as given in col 6 of Table F-2 shall be calculated. If the corrected mean satisfies the condition given in col 7 of Table F-2 the lot shall be considered as satisfying the requirement of the characteristic.

Table F-2 Criteria for Conformity

Sl No.	Characteristic	Test results	Mean	Range	Corrected	Criteria for Conformity
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Moisture	1, 2 …..*n*	X_1	R_1	$X_1 + 0.6\ R_1$	Corrected Mean < 50.0
ii)	Fat	1, 2 …..*n*	X_2	R_2	$X_2 - 0.6\ R_2$	Corrected Mean < 7.0
iii)	Sucrose	1, 2 …..*n*	X_3	R_3	$X_3 + 0.6\ R_3$	Corrected Mean < 45.0
iv)	Protein	1, 2 …..*n*	X_4	R_4	$X_4 - 0.6\ R_4$	Corrected Mean < 5.0

ANNEX G

(*Clause* E-3.1.1.1)

DEGREES BRIX, SPECIFIC GRAVITY AND DEGREES BAUME OF SUGAR SOLUTIONS

Degree Brix or Percent by Mass of Sucrose	*Specific Gravity at 20 °C/20 °C*	*Specific Gravity at 20 °C/4 °C*	*Degree Baume (Modulus 145)*
30.0	1.128 98	1.126 984	16.57
30.2	1.129 93	1.127 939	16.67
30.4	1.130 89	1.128 896	16.78
30.6	1.131 85	1.129 853	16.89
30.8	1.132 81	1.130 812	17.00
31.0	1.133 78	1.131 773	17.11
31.2	1.134 74	1.132 735	17.22
31.4	1.135 70	1.133 698	17.33
31.6	1.136 67	1.134 663	17.43
31.8	1.137 64	1.135 628	17.54
32.0	1.138 61	1.136 596	17.65
32.2	1.139 58	1.137 565	17.76
32.4	1.140 55	1.138 534	17.87
32.6	1.141 52	1.139 506	17.98
32.8	1.142 50	1.140 479	18.08
33.0	1.143 47	1.141 453	18.19
33.2	1.144 45	1.142 429	18.30
33.4	1.145 43	1.143 405	18.41
33.6	1.146 41	1.144 384	18.52
33.8	1.147 39	1.145 363	18.63
34.0	1.148 37	1.146 345	18.73
34.2	1.149 36	1.147 328	18.84
34.4	1.150 34	1.148 313	18.95
34.6	1.151 33	1.149 298	19.06
34.8	1.152 32	1.150 286	19.17
35.0	1.153 31	1.151 275	19.28
35.2	1.154 30	1.152 265	19.38
35.4	1.155 30	1.153 256	19.49
35.6	1.156 29	1.154 249	19.60
35.8	1.157 29	1.155 242	19.71
36.0	1.158 28	1.156 238	19.81
36.2	1.159 28	1.157 235	19.92
36.4	1.160 28	1.158 233	20.03
36.6	1.161 28	1.159 233	20.14
36.8	1.162 28	1.160 233	20.25
37.0	1.163 29	1.161 236	20.35
37.2	1.164 30	1.162 240	20.46
37.4	1.165 30	1.163 245	20.57
37.6	1.166 31	1.164 252	20.68
37.8	1.167 32	1.165 259	20.78
38.0	1.16833	1.166 269	20.89
38.2	1.169 34	1.167 281	21.00
38.4	1.170 36	1.168 293	21.11
38.6	1.171 38	1.169 307	21.21
38.8	1.17239	1.170322	21.32
39.0	1.173 41	1.171 340	21.43
39.2	1.174 43	1.172 359	21.54
39.4	1.175 45	1.173 379	21.64
39.6	1.176 48	1.174 400	21.75
39.8	1.177 50	1.175 423	21.86
40.0	1.178 53	1.176 447	21.97
40.2	1.179 56	1.177 473	22.07

Degree Brix or Percent by Mass of Sucrose	*Specific Gravity at 20 °C/20 °C*	*Specific Gravity at 20 °C/4 °C*	*Degree Baume (Modulus 145)*
40.4	1.180 58	1.178 501	22.18
40.6	1.181 62	1.179 527	22.29
40.8	1.182 65	1.180 560	22.39
41.0	1.183 68	1.181 592	22.50
41.2	1.184 72	1.182 625	22.61
41.4	1.185 75	1.183 660	22.72
41.6	1.186 79	1.184 696	22.82
41.8	1.187 83	1.185 734	22.93
42.0	1.188 87	1.186 773	23.04
42.2	1.189 92	1.187 814	23.14
42.4	1.190 96	1.188 856	23.25
42.6	1.192 01	1.189 901	23.36
42.8	1.193 05	1.190 946	23.46
43.0	1.194 10	1.191 993	23.57
43.2	1.195 15	1.193 041	23.68
43.4	1.196 20	1.194 090	23.78
43.6	1.197 26	1.195 141	23.89
43.8	1.198 31	1.196 193	24.00
44.0	1.199 36	1.197 247	24.10
44.2	1.200 42	1.198 303	24.21
44.4	1.201 48	1.199 360	24.32
44.6	1.202 54	1.200 420	24.42
44.8	1.203 60	1.201 480	24.53
45.0	1.204 67	1.202 540	24.63
45.2	1.205 73	1.203 603	24.74
45.4	1.206 80	1.204 668	24.85
45.6	1.207 87	1.205 733	24.95
45.8	1.208 94	1.206 801	25.06
46.0	1.210 01	1.207 870	25.17
46.2	1.211 08	1.208 940	25.27
46.4	1.212 15	1.210 013	25.38
46.6	1.213 23	1.211 086	25.48
46.8	1.214 31	1.212 162	25.59
47.0	1.215 38	1.213 238	25.70
47.2	1.216 46	1.214 317	25.80
47.4	1.217 55	1.215 395	25.91
47.6	1.218 63	1.216 476	26.01
47.8	1.219 71	1.217 559	26.12
48.0	1.220 80	1.218 643	26.23
48.2	1.221 89	1.219 729	26.33
48.4	1.222 98	1.220 815	26.44
48.6	1.224 06	1.221 904	26.54
48.8	1.225 16	1.222 995	26.65
49.0	1.226 25	1.224 086	26.75
49.2	1.227 35	1.225 180	26.86
49.4	1.228 44	1.226 274	26.96
49.6	1.229 54	1.227 371	27.07
49.8	1.230 64	1.228 469	27.18
50.0	1.231 74	1.229 567	27.28
50.2	1.232 84	1.230 668	27.39
50.4	1.233 95	1.231 770	27.49
50.6	1.235 06	1.232 874	27.60
50.8	1.236 16	1.233 979	27.70
51.0	1.237 27	1.235 085	27.81
51.2	1.238 38	1.236 194	27.91
51.4	1.239 49	1.237 303	28.02
51.6	1.240 60	1.238 414	28.12
51.8	1.241 72	1.239 527	28.23

Degree Brix or Percent by Mass of Sucrose	*Specific Gravity at 20 °C/20 °C*	*Specific Gravity at 20 °C/4 °C*	*Degree Baume (Modulus 145)*
52.0	1.242 84	1.240 641	28.33
52.2	1.243 95	1.241 757	28.44
52.4	1.245 07	1.242 873	28.54
52.6	1.246 19	1.243 992	28.65
52.8	1.247 31	1.245 113	28.75
53.0	1.248 44	1.246 234	28.86
53.2	1.249 56	1.247 358	28.96
53.4	1.250 69	1.248 482	29.06
53.6	1.251 82	1.249 609	29.17
53.8	1.252 95	1.250 737	29.27
54.0	1.254 08	1.251 866	29.38
54.2	1.255 21	1.252 997	29.48
54.4	1.256 35	1.254 129	29.59
54.6	1.257 48	1.255 264	29.69
54.8	1.258 62	1.256 400	29.80
55.0	1.259 76	1.257 535	29.90
55.2	1.260 90	1.258 674	30.00
55.4	1.262 04	1.259 815	30.11
55.6	1.263 19	1.260 955	30.21
55.8	1.264 33	1.262 099	30.32
56.0	1.265 48	1.263 243	30.42
56.2	1.266 63	1.264 390	30.52
56.4	1.267 78	1.265 537	30.63
56.6	1.268 93	1.266 686	30.73
56.8	1.270 08	1.267 837	30.83
57.0	1.271 23	1.268 989	30.94
57.2	1.272 39	1.270 143	31.04
57.4	1.273 55	1.271 299	31.15
57.6	1.274 71	1.272 455	31.25
57.8	1.275 87	1.273614	31.35
58.0	1.277 03	1.274 774	31.46
58.2	1.278 19	1.275 936	31.56
58.4	1.279 36	1.277 098	31.66
58.6	1.280 52	1.278 262	31.76
58.8	1.281 69	1.279 428	31.87
59.0	1.282 86	1.280 595	31.97
59.2	1.284 04	1.281 764	32.07
59.4	1.285 20	1.282 935	32.18
59.6	1.286 38	1.284 107	32.28
59.8	1.287 55	1.285 281	32.38
60.0	1.288 73	1.286 456	32.49
60.2	1.289 91	1.287 633	32.59
60.4	1.291 09	1.288 811	32.69
60.6	1.292 27	1.289 991	32.79
60.8	1.293 46	1.291 172	32.90
61.0	1.294 64	1.292 354	33.00
61.2	1.295 83	1.293 539	33.10
61.4	1.297 01	1.294 725	33.20
61.6	1.298 20	1.295 911	33.31
61.8	1.299 40	1.297 100	33.41
62.0	1.300 59	1.298 291	33.51
62.2	1.301 78	1.299 483	33.61
62.4	1.302 98	1.300 677	33.72
62.6	1.304 18	1.301 871	33.82
62.8	1.305 37	1.303068	33.92
63.0	1.306 57	1.304 267	34.02
63.2	1.307 78	1.305 467	34.12
63.4	1.308 98	1.306 669	34.23

Degree Brix or Percent by Mass of Sucrose	*Specific Gravity at 20 °C/20 °C*	*Specific Gravity at 20 °C/4 °C*	*Degree Baume (Modulus 145)*
63.6	1.310 19	1.307 872	34.33
63.8	1.311 39	1.309 077	34.43
64.0	1.312 60	1.310 282	34.53
64.2	1.313 81	1.311 489	34.63
64.4	1.315 02	1.312 699	34.74
64.6	1.316 23	1.313 909	34.84
64.8	1.317 45	1.315 121	34.94
65.0	1.318 66	1.316 334	35.04
65.2	1.319 88	1.317 549	35.14
65.4	1.321 10	1.318 766	35.24
65.6	1.322 32	1.319 983	35.34
65.8	1.323 54	1.321 203	35.45

ANNEX H

(*Foreword*)

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